UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,173	03/30/2004	Inching Chen	884.B97US1	7124

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EXAMINER
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ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/815,173	CHEN, INCHING
	Examiner	Art Unit	
	Paul W. Schlie	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 March 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-26</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-26</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>30 March 2004</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-26 have been examined.

Drawings

2.   The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, it is necessary to depict the interconnection of a MIMD computational unit being interconnected to the shared memory unit, as all features must be shown or canceled from the claims; however new matter not supported by the original disclosure may not be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheets should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject that which the applicant regards as his invention.

4.   Claim 1-22 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

As within claims 1, 8, 11, 16 and 20, the term "about" renders them and their

dependant's indefinite. As if B defines to the total number of simultaneously accessible

banks, and 2^N specifies the number of banks accessed; 2^N must be less than or

equal to (not "about") B, to be considered definite to one of ordinary skill in the art (as

the number of banks accessed could not exceed the total number of banks present.

5.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

6.   Claims 3, 9, 20-22 are rejected under 35 U.S.C. 112, first paragraph, as based

on a disclosure that is not enabling. As elements critical or essential to the practice of

the invention are neither included in the claims nor enabled by the disclosure. See *In re

Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

As per claims 3, 9 and 20, the claim of being capable of supporting a multiple-

instruction/multiple-data (MIMD) operation type is not considered enabled, as it is

considered well understood by those of ordinary skill a the time of the claimed invention

that that MIMD operations inherently implies the corresponding requirement of a

memory subsystem being capable of satisfying a request of multiple independent non-correlated instruction and/or data streams simultaneously, thereby may not rely on a single root address to derive correspondingly required bank addresses as disclosed (unlike single-instruction/multiple-data operations which may inherently utilize a single root address to derive multiple correlated data access requests in conjunction with an access mode indication being associated with the instruction being processed). Thereby critical elements are considered be lacking from either the disclosure and/or the claims to enable one of ordinary skill in the art at the time of the disclosure to make or use the claimed invention without undue experimentation.

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8.   Claims 1, 8, 11, 16, 20 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Wingard et al. (6,182,183).

As per claims 1, 8, 11, 16, 20 and 23, Wingard et al. teaches an interface architecture whereby multiple computation units having potentially dissimilar data operational/bandwidth (i.e. protocol) requirements may interface to a common logical memory interface, whereby each computation unit may access said memory as a function of it's said protocol requirement (inclusive of its logical data address, width, and/or sequencing requirements) to enable such a system's efficient configuration and

utilization of said logical memory bandwidth. Where within such a system, if said

memory were composed of interleaved B memory banks of some unit width (as is

commonly understood as being a design choice by those of ordinary skill in the art to

enable an arbitrary number of such banks within a logically contiguous mod B bank

range to be selectively enabled/accessed/modified simultaneously), it's correspondingly

considered inherent that any $2^{\wedge}(0..N : N = Log2(B))$ unit width data may be selectively

enabled for access and/or modification from within a set of B interleaved unit width

banks to satisfy such a request, where is N is a function of a corresponding protocol

requirements associated with a computational unit's configuration requirements and/or

programming as taught. Thereby such a system's memory access bandwidth efficiency

may be correspondingly configured as a function of either the program specified to be

executed by said computational units, and/or configuration of the computational units,

memory controller and/or memory banks themselves as may be synthesized and

instantiated within a mask programmed integrated circuit, and/or dynamically

instantiated within a reprogrammable logic device comprising integrated memories as

commonly understood to be commercially available by those of ordinary skill in the art at

the time of the claimed invention. (See figures 2-4 and 11-12, column 1 lines 17-23, 31-

46, column 2 lines 53-60, column 4 lines 20-63, column 5 lines 7-27, column 7 lines 24-

35; and although not cited as the basis of the rejection please see Dill et al. 4,667,305

which teaches generalized modular multi-bank variable data width memory address

decoding and access.)

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 2-7, 9-10, 12-15, 17-19, 21-22, 24-26 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Wingard et al. (6,182,183) in further view of Ing-Simmons et

al. (5,239,654).

As per claims 2-7, 9-10, 12-15, 17-19, 21-22 and 24-26, being dependent on

claim 1, 8, 11, 16, 20, 23, or correspondingly dependent claim, as further taught by

Wingard et al., said individual computational units may inherently have differing

operational memory interface protocol requirements as reviewed above as may be

configured in reconfigurable hardware (claims 2, 4, 6), but does not explicitly teach that

such computational units may be composed of SIMD and/or MIMD architectures (claim

3), that crossbar multiplexer configuration may be utilized to interconnect arbitrary

computational units with arbitrary combinations of memory banks (claim 7), or that each

memory bank may be considered to have it's own address generator (claim 15);

however Ing-Simmons et al. does explicitly teach such elements (see abstract and

figures 1-17, and in particular figure 62 in combination with figure 30 which shows that

for SIMD mode configurations individual banks of memory may be inherently partitioned

to have their own address units as depicted within figure 30, as they share a common

program flow as depicted in figure 62, and correspondingly obvious that such a

partitioning may not efficient for MIMD mode configurations by analogy, although may

contain bank decode address modification logic as taught by Dill et al. to enable parallel modular bank addressing as noted above but not cited as the basis of the rejection). Thereby it would be obvious to one of ordinary skill in the art at the time of the claimed invention to combine that taught by Wingard et al. with that taught by Ing-Simmons et al. relevant to the claims for the benefit of enabling an arbitrary interconnection between an arbitrary number of computational units and memory bank based upon each of the said computational unit's operational protocol/algorithm/bandwidth memory requirements to enable a potentially more optimal and/or efficient utilization of such a configured system's available resources. Further as claims 9-10, 12-14, 17-19, 21-22 and 24-26 are claims 2-7, or 15 in other form, they are correspondingly rejected based on the same arguments as presented above.

Conclusion

11.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul W. Schlie whose telephone number is 571-272-6765. The examiner can normally be reached on Mon-Thu 8:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 517-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

PIERRE BATAILLE
PRIMARY EXAMINER
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